

THE MANIFESTATION OF KEY ISSUE FEATURES OF GLOBAL PERSPECTIVES ON
INNOVATIVE TEACHING AND LEARNING APPROACH STRATEGIES IN HIGHER
MEDICAL EDUCATION: ADVANCING STUDENT-CENTERED PRACTICES, TECHNOLOGY
INTEGRATION AND COMPETENCY-BASED FRAMEWORKS

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Abstract

The global transformation of medical education emphasizes modern teaching and learning methodologies to address the evolving needs of healthcare professionals. Traditional lecture-based methods are being replaced or complemented by innovative approaches such as problem-based learning (PBL), case-based learning (CBL), team-based learning (TBL), flipped classrooms, and simulation-based education. These methods foster critical thinking, collaborative problem-solving, and active participation among students. Technological integration, including e-learning platforms, virtual simulations, and augmented reality, has revolutionized medical education, enhancing accessibility and interactive learning experiences. Competency-based education and interprofessional collaboration are increasingly prioritized to align educational objectives with healthcare system demands. However, challenges such as resistance to change, resource limitations, and maintaining assessment validity persist. This study provides a comprehensive review of modern teaching strategies, their benefits, and their

implementation in medical education, with an emphasis on fostering student-centered learning environments to prepare future professionals for complex healthcare challenges.

Keywords: Higher education institutions, medical education, student-centered learning technology integration, competency-based education.

გლობალური პერსპექტივების ძირითადი მახასიათებლების გამოვლენა
სამედიცინო უმაღლესი განათლების ინოვაციური სწავლებისა და სწავლის
მეთოდოლოგიებში: სტუდენტზე ორიენტირებული პრაქტიკის, ტექნოლოგიების
ინტეგრაციისა და კომპეტენციაზე დაფუძნებული ჩარჩოების განვითარების
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აბსტრაქტი

სამედიცინო განათლების გლობალური ტრანსფორმაცია ხაზს უსვამს სწავლებისა და სწავლის თანამედროვე მეთოდოლოგიებს, რათა მოხდეს ჯანდაცვის პროფესიონალების განვითარებადი საჭიროებების დაკმაყოფილება. ტრადიციული ლექციებზე დაფუძნებული მეთოდები იცვლება ან ავსებს ინოვაციური მიდგომებით, როგორიცაა პრობლემებზე დაფუძნებული სწავლება (PBL), შემთხვევებზე დაფუძნებული სწავლება (CBL), გუნდზე დაფუძნებული სწავლება (TBL), შებრუნებული

საკლასო ოთახები და სიმულაციაზე დაფუძნებული განათლება. ეს მეთოდები ხელს უწყობს კრიტიკულ აზროვნებას, კოლაბორაციულ პრობლემების გადაწყვეტას და აქტიურ მონაწილეობას სტუდენტებში. ტექნოლოგიების ინტეგრაცია, მათ შორის ელექტრონული სწავლების პლატფორმები, ვირტუალური სიმულაციები და გაფართოებული რეალობა, რევოლუციას ახდენს სამედიცინო განათლებაში, აუმჯობესებს ხელმისაწვდომობას და ინტერაქტიული სწავლების გამოცდილებას. კომპეტენციაზე დაფუძნებული განათლება და ინტერპროფესიული თანამშრომლობა უფრო მეტად ხდება პრიორიტეტული, რათა საგანმანათლებლო მიზნები შესაბამისობაში მოვიდეს ჯანდაცვის სისტემის მოთხოვნებთან. მიუხედავად ამისა, ისეთი გამოწვევები, როგორიცაა ცვლილებებისადმი წინააღმდეგობა, რესურსების შეზღუდვები და შეფასების ვალიდურობის შენარჩუნება, კვლავ აქტუალურია. ეს კვლევა წარმოადგენს სწავლების თანამედროვე სტრატეგიების, მათი სარგებლისა და განხორციელების მიმოხილვას სამედიცინო განათლებაში, ხაზს უსვამს სტუდენტზე ორიენტირებული სასწავლო გარემოს შექმნას, რათა მომავალი პროფესიონალები მზად იყვნენ ჯანდაცვის რთული გამოწვევებისთვის.

საკვანძო სიტყვები: უმაღლესი საგანმანათლებლო დაწესებულებები, სამედიცინო განათლება, სტუდენტზე ორიენტირებული სასწავლო ტექნოლოგიების ინტეგრაცია, კომპეტენციებზე დაფუძნებული განათლება.

Introduction

In recent years, the field of higher medical education has undergone significant transformation, driven by the rapid evolution of technology, shifting pedagogical paradigms, and the demand for more student-centered approaches. As global perspectives on teaching and learning advance, educators in medical institutions are increasingly adopting innovative strategies to meet the needs of 21st-century learners. These strategies emphasize active participation, technological integration, and competency-based frameworks, which align with the expectations of healthcare systems worldwide.

The shift towards student-centered practices marks a departure from traditional, lecture-based instruction. It emphasizes personalized learning experiences that cater to diverse student needs, promote critical thinking, and foster lifelong learning skills. Moreover, advancements in technology, including simulation-based training, virtual reality (VR), and artificial intelligence (AI)-driven tools, have revolutionized the way medical students acquire clinical knowledge and skills. These technologies not only enhance engagement but also allow for realistic, hands-on experiences in a controlled, risk-free environment.

Competency-based education has also emerged as a cornerstone of modern medical training, focusing on measurable outcomes rather than time-based progression. This approach ensures that students master essential competencies before advancing, ultimately producing healthcare professionals who are better equipped to meet the complex demands of patient care. Despite these advancements, challenges remain in effectively implementing these strategies on a global scale. Differences in resource availability, faculty training, and cultural attitudes towards education can hinder progress. However, the continued exchange of global perspectives and best practices offers promising opportunities to address these issues and elevate the standards of medical education worldwide.

This study aims to explore the manifestation of key issues and features associated with global perspectives on innovative teaching and learning strategies in higher medical education, with a focus on advancing student-centered practices, integrating technology, and reinforcing competency-based frameworks.

Lectures have long been the predominant and most widely used method in traditional teaching and learning. This approach primarily involves instructors delivering extensive information with limited student engagement. Typically, lectures take place in teacher-centered classrooms, where the focus is on the instructor, content, and student comprehension. While lectures are favored for their straightforward delivery, suitability in overcrowded classrooms, and efficiency in covering substantial theoretical material, students often struggle to absorb, recall, and interpret the vast amount of information presented. However, learning is an interactive process that requires collaboration between students and instructors to make knowledge sharing both engaging and comprehensible. For learning to be truly effective, teaching methods must promote critical thinking and focus on addressing key challenges. Students need to apply the knowledge and skills acquired in class to achieve their professional aspirations. This requires incorporating diverse learning styles, offering opportunities for feedback, and fostering discussions to enhance their understanding. Therefore, it is essential to adopt teaching and learning strategies that align with the unique needs of students.

Educational methods and experiences include learning and teaching techniques aimed at achieving specified learning outcomes and supporting students' independent learning. This experience may be formal or informal, group or individual, and may be a medical school, community, secondary or tertiary experience or educational experience.

The choice is determined by the curriculum and local cultural issues related to education, as well as the available human and material resources.

The integration of technology into medical education has revolutionized traditional teaching methods. E-learning platforms, virtual simulations, and mobile applications provide students with access to resources and interactive experiences beyond the classroom. The use of telemedicine and digital health tools also prepares students for modern healthcare delivery systems.

Competency-based education (CBE) is gaining prominence in medical training, focusing on the acquisition of specific competencies necessary for effective practice. CBE emphasizes outcomes rather than time-based curricula, enabling students to progress at their own pace while mastering clinical skills. This approach aligns educational objectives with the demands of the healthcare profession.

Interprofessional education (IPE) fosters collaboration among healthcare professionals from diverse fields. IPE programs promote teamwork and communication skills, essential for providing patient-centered care in complex healthcare settings. By engaging medical students with nursing, pharmacy, and allied health students, IPE enhances understanding of the roles and responsibilities of various healthcare providers.

Assessment and Feedback: The modern assessment methods are evolving to reflect the competencies required in medical practice. Formative assessments, direct observation, and feedback mechanisms play a crucial role in guiding student learning. Tools such as Objective Structured Clinical Examinations (OSCEs) and workplace-based assessments (WPBA) ensure that students are evaluated on their practical skills in real-world settings.

Challenges in Implementing Modern Teaching Methods: Despite the benefits of modern teaching and learning methods, several challenges impede their widespread adoption in medical education: Resistance to change, many educators are accustomed to traditional teaching methodologies, leading to resistance when implementing new approaches. Overcoming this inertia requires ongoing professional development and training to equip instructors with the skills necessary for innovative teaching.

Resource Constraints: Limited resources, including funding, technology, and personnel, can hinder the effective implementation of modern teaching methods. Higher education institutions must prioritize investment in educational technologies and infrastructure to support innovative teaching practices.

Assessment Validity: Ensuring the validity and reliability of assessment methods remains a challenge in competency-based medical education. Developing robust assessment tools that accurately measure student competencies is essential for maintaining educational quality and accountability.

Maintaining Student Engagement: As educational methods evolve, maintaining student motivation and engagement can be challenging. Continuous evaluation of teaching strategies and incorporation of student feedback are vital to creating an engaging learning environment.

It is impossible to study any specific issue in the teaching process with only one method and one activity. In the teaching process, the teacher has to use activities of different methods, and in many cases, there is a combination of activities. During the teaching process, the activities complement each other.

➤ **Modern Techniques of Teaching and Learning in Medical Education**

The article reviews various contemporary learning methodologies, including case-based learning, evidence-based medicine, problem-based learning, simulation-based learning, e-learning, peer-assisted learning, observational learning, flipped classrooms, and team-based learning. These methods cater to individual learning differences, enhancing students' critical thinking, clinical reasoning, and time management skills.

➤ **Innovative Teaching Methods in Health Professions Education**

The study piece explores the integration of technology-enhanced methods, simulation-based training, flipped classrooms, and active learning strategies in healthcare education. These approaches promote active student engagement, personalized learning experiences, and the development of critical thinking and clinical reasoning skills.

➤ **A Review on Modern Teaching and Learning Techniques in Medical Education**

This review identifies various modern learning methodologies, including case-based learning, evidence-based medicine, problem-based learning, simulation-based learning, e-learning, peer-assisted learning, observational learning, flipped classrooms, and team-based learning. These methods address individual learning differences, allowing students to broaden their thinking and professional knowledge.

➤ **Innovative Teaching Strategies in Modern Medical Education**

The article discusses the shift towards hands-on training, interactive learning, and real-world simulations in medical education. These methods ensure that medical students and professionals are well-prepared for clinical practice.

➤ **Current and Emerging Medical Education Teaching Methods**

This paper reviews the current and emerging teaching methods in medical education, considering their history, style, and core focus.

➤ **Augmented Reality in Higher Education: A Case Study in Medical Education**

The study presents how augmented reality (AR) can be used as a teaching aid for medical education, focusing on remote and socially distanced learning. An Augmented Reality (AR)-enhanced learning tool, was developed to assist medical students in understanding complex anatomical structures. The study introduces the principles of prompt engineering for large language models and applies them to medical education. It provides a comprehensive guide to help both teachers and students improve education in the medical field by leveraging AI technologies.

In an era marked by rapid scientific and technological advancements, the field of medical education has undergone a significant paradigm shift. The traditional approaches, characterized by lecture-based instruction and rote memorization, are being redefined by innovative teaching and learning methodologies. These modern methods aim to meet the evolving demands of global healthcare systems, equipping future medical professionals with the skills necessary to address complex medical challenges, adapt to emerging technologies, and provide patient-centered care.

Central to this transformation is the adoption of student-centered pedagogies such as problem-based learning (PBL), case-based learning (CBL), team-based learning (TBL), and flipped classrooms. These methods encourage active participation, critical analysis, and collaborative problem-solving among students, fostering a deeper understanding of medical concepts and their real-world applications. Simulation-based education, using tools like high-fidelity mannequins and virtual patients, provides a safe and controlled environment for students to practice clinical skills, enhancing their competence and confidence.

Goal

Aim of the research was to study key issue features of global perspectives on innovative teaching and learning methodologies in higher medical education: advancing student-centered practices, technology integration and competency-based frameworks.

Methodology

The material of the article was the revised data from scientific publications, which were processed, analyzed, overviewed and reviewed by generalization and systematization. Research studies are based on a review/overview assessment of the development of critical visibility and overlook of the modern scientific literature and our study programs and curriculums. Use the following databases (for extensive literature searches to identify key issue facets of manifestation of modern teaching and learning methods in higher education institutions in medical educational study programs directions globally.): Web of Knowledge, PubMed, Scopus, Web of Science, Clinical key, Thomson Reuters, Google Scholar, Cochrane Library, Science Direct, Research Gate and Elsevier Foundations. The methodology for discussing the key issue facets of manifestation of modern teaching and learning methods in higher education institutions in medical educational study programs directions globally.

Results and Discussion

Key issues in modern teaching and learning methods and student-centered learning: One of the primary facets of contemporary medical education is the shift toward student-centered

learning. This approach places learners at the forefront of the educational process, encouraging active participation, collaboration, and self-directed learning. Techniques such as problem-based learning (PBL), team-based learning (TBL), and flipped classrooms are increasingly utilized to promote engagement and critical thinking among medical students. Modern learning methods such as case-based learning (CBL), evidence-based medicine (EBM), problem-based learning (PBL), simulation-based learning (SBL), e-learning, peer-assisted learning (PAL), observation learning, flipped classroom models, and team-based learning (TBL) meet diverse learning needs. These approaches address individual learning preferences and enable students to expand their critical thinking, clinical reasoning, and time management skills while deepening their professional knowledge. Early integration of these methods promotes competence and leadership and prepares students for a seamless transition into clinical practice. The study highlights the importance and challenges of adopting modern learning strategies. As technology advances and medical information becomes more complex, students must acquire innovative skills through interprofessional and multidisciplinary education. To meet these needs, medical curricula must be adaptable and incorporate contemporary teaching methods, striking a balance between traditional teaching and modern educational practices.

Knowledge acquisition is a holistic, dynamic, consciously directed, and deeply personal process that involves the interpretation of personal information and experiences. This idea implies that people have an innate tendency to learn when they are in a supportive and motivating environment, and that the learning experience is deeply personal. So, a motivated student is a constant seeker of knowledge, and vice versa. The desire to learn and the desire to understand are innate traits shaped by a person's self-perception, desires, and expectations. Lifelong learning is also a fundamental human ability that is fostered by recognizing our unique learning patterns. Therefore, it is important to encourage independent learning strategies because these are the most sustainable and ambitious. These strategies should align with the responsibilities and priorities that students consider important. Teachers should clearly communicate educational goals and explain how specific activities will help students achieve their goals. Teachers must also understand the individual needs of each student and design activities that meet those needs while emphasizing motivation. Creating a motivating environment can include building social connections (e.g., friendships), meeting expectations, achieving professional growth, and receiving intellectual rewards. The best educational experiences are self-paced, interactive experiences that encourage student engagement, sharing of ideas, and active participation in discussions.

In the past, traditional lectures were the cornerstone of learning during the preclinical years. These regular lectures were the main means of imparting knowledge to students. However, this passive learning model has been heavily criticized, leading to the introduction of innovative teaching strategies. Traditional lectures often lack interactive elements and are not dynamic learning tools, which limits students' ability to deepen their understanding through collaboration. Students are increasingly reluctant to participate in academic activities outside the classroom. Modern teaching methods, on the other hand, place the learner at the forefront and make him or her fully responsible for acquiring knowledge. The rapid development of medical systems requires the creation of an educational system that actively involves future specialists in the learning process. Instead of simply listening, students become full participants, participating directly and continuously. These active learning methods have been shown to be more effective

than traditional lectures and significantly improve knowledge acquisition, comprehension, long-term retention, and independent learning in medical education.

In the teaching process, it is impossible to study any specific issue with only one method. The professor has to use different methods in the teaching process, in many cases there is a combination of methods. For example, in a lecture, the lecturer presents the lecture material in the form of a visual presentation accompanied by a verbal explanation; A discussion is held, a task is given to the student for independent work, which he completes in the form of working on a book, making a note, etc. Thus, in the process of teaching and learning, the methods complement each other and move into each other.

There are many classifications of teaching-learning methods, the most common options are presented.

A verbal, i.e. oral study method refers to a learning technique that relies primarily on spoken language for the absorption and retention of information. In this method, information is conveyed and understood through listening, speaking, and discussion, rather than through reading or writing. This can include techniques such as lectures, verbal repetition, oral quizzes, group discussions, or recitation. It emphasizes auditory learning and verbal communication to enhance comprehension and memory retention.

The method of working on the book refers to a systematic approach to studying or analyzing a book in depth. This method typically involves several stages: Previewing – Skimming the book to get an overview of its structure, main themes, and key ideas. Active Reading – Engaging with the text by reading carefully, taking notes, highlighting important points, and asking questions as you go. Summarizing – Writing brief summaries of chapters or sections to consolidate understanding and retain information. Critical Analysis – Evaluating the content, arguments, and perspectives presented in the book, and considering their validity and implications. Reviewing – Going over the material multiple times to reinforce learning and deepen comprehension. This method can also include reflective thinking, discussion, and connecting the book's content to other knowledge or experiences.

The method of written work, which involves the following types of activities: making extracts and notes, summarizing material, drawing up theses, writing a report or essay, etc.

Laboratory method and demonstration method - the latter, in turn, involves the following types of activities: setting up tests, showing video materials, dynamic material, etc.

Practical methods - combines all those forms of teaching that form practical skills of the student, here the student independently performs one or another activity based on the acquired knowledge, for example: Pedagogical practice, field work, etc.

Discussion/debate is one of the most common methods of interactive learning. The discussion process dramatically increases the quality and engagement of students. The discussion can turn into an argument. This process is not limited to the questions asked by the professor. This method develops the student's ability to argue and justify his opinion.

Collaborative work - teaching with this method involves dividing students into groups and giving them a learning task. Group members work on the issue individually and simultaneously share it with the rest of the group. Depending on the set task, it is possible to redistribute functions among the members during the work of the group. This strategy ensures maximum involvement of all students in the learning process.

Problem-based learning (PBL) - a learning method that uses a problem as the initial stage of the process of acquiring and integrating new knowledge.

Cooperative teaching is a teaching strategy where each member of the group is obliged not only to learn, but also to help his teammate to learn the subject better. Each group member works on the problem until all of them have mastered the issue.

The heuristic method is based on the step-by-step solution of the problem posed to the students. This task is carried out in the teaching process by identifying the facts independently and seeing the connections between them.

Case study (Case study) - during the lecture, the professor will discuss specific cases with the students, who will study the issue in every way and thoroughly. For example, in the field of medicine, it can be the review and analysis of the history of a particular patient's illness and so on.

Brain storming - this method involves the formation and expression of as many, preferably radically different, opinions and ideas about a specific issue/problem within a specific topic. This method contributes to the development of a creative approach to the problem. This method is effective in the presence of a large group of students and consists of several main stages: defining the problem/issue from a creative angle. Non-critically writing down (mostly on the board) the ideas surrounding the issue from the audience in a certain period of time. Eliminating ideas that are most relevant to the issue at hand. Defining evaluation criteria to determine the relevance of the idea to the research objective. Evaluation of selected ideas with predetermined criteria. Revealing the idea with the highest rating as the best way to solve the problem.

Role-Playing and Situational Games – Scenario based on role-plays and allow students to look at an issue from different perspectives and help them develop alternative points of view. Like discussion, role-playing also develops the student's ability to express his position independently and defend it in an argument.

Demonstration method – this method involves presenting information visually. From the point of view of achieving the result, it is quite effective. In many cases, it is better to provide the material to the students simultaneously in audio and visual way. The material to be studied can be demonstrated by both the teacher and the student. This method helps us to make visible the various stages of understanding the learning material, to specify what the students will have to do independently; At the same time, this strategy visualizes the essence of the issue/problem. Demonstration may be simple, such as solving a mathematical problem by displaying its steps on a whiteboard, or complex, such as conducting a multi-step science experiment.

Induction is a method of reasoning that involves drawing general conclusions from specific observations or instances. Explanation: In the inductive approach, you begin with particular cases, observations, or data points, and from these, infer a broader generalization or theory. This method is often used in scientific research where repeated observations lead to the formation of hypotheses or laws. For example, observing that the sun rises every day and concluding that the sun always rises in the east is an inductive inference. Application in Study: In studying, induction helps students make connections by analyzing patterns or trends across multiple cases to form a broader understanding of a subject or concept.

Deduction is a method of reasoning that starts with a general principle or theory and applies it to specific instances to draw a conclusion. In the deductive approach, you begin with a general statement, premise, or theory and use it to predict or explain specific observations. This

process is logical and moves from a broad theory to a specific conclusion. In studying, deduction allows learners to apply established theories or rules to specific problems or examples, which is useful in fields like mathematics, logic, or law.

Team-based learning (TBL) has been shown to be one of the most effective learning approaches in medical education, emphasizing a student-centered structure. In this method, small groups of students carry out activities that promote the practical application of theoretical concepts. Team learning includes critical thinking, individual and collaborative tasks, brainstorming sessions, and immediate instructor feedback. It offers significant benefits by improving communication and teamwork skills in groups of students, essential skills for effective patient care. Compared to problem-based learning (PBL), team learning encourages greater student participation. One of the main benefits of team learning is that it encourages students to solve problems and make decisions together, which increases motivation, facilitates the discovery of concepts, and promotes deeper understanding. Instructors who facilitate small group discussions using a team-based learning model have shown better student performance on exams compared to traditional lecture-based learning.

Analysis is the process of breaking down a complex topic or substance into its components to better understand its structure or function. In analysis, you examine the individual parts of a whole, studying their relationships and functions in isolation to better understand the entire system. This method is crucial in critical thinking, allowing a detailed and in-depth examination of various elements within a concept, problem, or text. For example, analyzing a novel would involve looking at its plot, characters, themes, and language style separately. Analysis is often used in studying literature, sciences, and humanities, where learners must dissect and examine ideas, arguments, and data to understand the core aspects of a subject.

Synthesis is the process of combining different ideas, information, or components to form a cohesive whole or new understanding. In synthesis, you take the analyzed parts of a concept or data and integrate them to form a new, unified perspective. This method moves from individual elements to an overall understanding, allowing the learner to create something new from previously separate pieces of knowledge. For example, after analyzing various sources in an essay, synthesis would involve combining these viewpoints into a single, coherent argument. Synthesis is used to combine knowledge from different areas to create new insights or solutions. It's essential in research writing, problem-solving, and the development of new ideas in disciplines like philosophy, history, and science.

Summary:

- Induction: From specific to general (forming theories from observations).
- Deduction: From general to specific (applying theories to specific cases).
- Analysis: Breaking down complex information into simpler components.
- Synthesis: Combining elements to create a new whole or understanding.

The inductive method of teaching defines such a form of knowledge of any subject, when the course of thought in the learning process is directed from particular to concrete, from facts to generalization, that is, when conveying material, the process proceeds from concrete to general.

The deductive method of teaching defines a form of transfer of any subject knowledge, which is a logical process of discovering new knowledge based on general knowledge, that is, the process proceeds from the general to the specific.

In the learning process, the method of analysis helps us to break down the learning material as a whole into its component parts, thereby facilitating the detailed coverage of individual issues within complex problems.

The synthesis method involves the reverse procedure, that is, by grouping separate issues to form a single whole. This method helps to develop the ability to see problems as a whole.

Explanatory method - based on reasoning around the given issue. When presenting the material, the professor cites a specific example, which is discussed in detail within the given topic.

Action-oriented teaching - requires the active involvement of the professor and the student in the teaching process, where the practical interpretation of the theoretical material acquires special importance.

Electronic learning (E-learning) – this method includes three types of teaching: attended, when the teaching process takes place within the contact hours of the professor and students, and the transfer of educational material is carried out through an electronic course. Hybrid (face-to-face/distance), the main part of the teaching takes place at a distance, and a small part is carried out within the framework of contact hours. Completely distance learning involves conducting the learning process without the physical presence of the professor. The training course is conducted from the beginning to the end remotely in an electronic format. In addition to the given basic methods, there are many teaching methods that the teacher can choose depending on the specific learning task.

Teaching-learning methods and corresponding activities and main teaching learning methods: lecture, seminar, laboratory and practical work; training and production practices; course work/project; bachelor's, master's and doctoral theses; e-learning; consultation.

A lecture is a creative process in which the lecturer and the student participate simultaneously. The main goal of the lecture is to understand the idea of the provisions of the studied subject, which implies a creative and active perception of the presented material. In addition, attention should be paid to the basic provisions, definitions, designations, and assumptions of the transmitted material. Critical analysis of key issues, facts and ideas is required. The lecture should provide a scientific and logically coherent introduction to the basic tenets of the studied subject without overloading it with unnecessary details. Therefore, it must be logically complete. In addition, facts, examples, diagrams, drawings, experiments and other visual aids should serve to explain the idea of the lecture.

The lecture should provide a correct analysis of the dialectical process of science and should be learned in a specific environment by focusing on the ability of students to think freely, to know and understand basic scientific problems.

The material heard at the lecture is formed into a whole knowledge system by the independent work of the student. The student should be interested in books and other sources of information and the desire to study issues independently, which is a means of stimulating independent thinking, analysis and drawing conclusions.

Based on the main purpose of the lecture, the right to read it should be given only to experienced teachers, since their theoretical knowledge, practical experience and pedagogical skill are the guarantee of conducting the lecture at a high level. During the processing of the methodical issues of the lecture, the teacher should focus on the sequence of the transfer of the material, the style of the lecture, and the connection with the audience. The lecture should be

conducted with the active participation of students, methodical means and extensive use of visual aids.

Theoretical material, which is given in lectures, is well understood by seminars, laboratory and practical studies.

The purpose of the seminar (group work) is to give students an opportunity to deepen the topics heard during the lecture. Under the guidance of the leading professor or the leading teacher of the seminar, a student or a group of students will search for and process additional information, prepare a presentation, write an essay, etc. At the seminar, reports will be heard, discussions will be held, and conclusions will be made. The head teacher of the seminar coordinates the purposeful management of these processes.

Laboratory work is more visible and allows the perception of this or that event or process. In the laboratory, the student learns to conduct an experiment. During the laboratory studies, the student should learn how to set up, adjust and operate the equipment.

Habits developed in experiential learning laboratories allow understanding of theoretical material heard in lectures. It involves the following types of actions: setting tests, showing video material, dynamic material, etc.

The purpose of practical work is the gradual study of theoretical material through the solution of specific tasks, which is the basis for developing habits of independent use of theoretical material. The head of practical education should focus on the methodology of problem solving, the execution of drawings, sketches, schemes, the use of appropriate techniques in calculations, etc.

Practice (educational and industrial) serves to deepen and strengthen the knowledge acquired by the student. It develops the ability to apply knowledge in practice, to use methods specific to the studied subject to solve problems. It combines all the teaching methods that form the student's practical skills. In this case, the student independently performs this or that action based on the acquired knowledge, for example, pedagogical practice, field work, etc.

Course work/project is a creative process. Each new building, machine, tool, automatic device, etc. is created according to the project. The design process is a combination of theory and practice. During the teaching period, the student completes graphic assignments and course projects, which are, in fact, the student's first independent work, although it is carried out under the guidance of the teacher. A bachelor's, master's and doctoral thesis is the final stage of a separate level of education in a higher educational institution, and its purpose is to systematize the theoretical and practical knowledge gained in the specialty and to provide a substantiated solution to specific scientific, technical, economic or production tasks. The paper should reveal the level of mastery of research methods and experiments related to the issues and the student's readiness for independent work in the future professional activity. The work is supervised by an experienced teacher.

Electronic learning (E-learning) - refers to teaching through the Internet and multimedia tools. It includes all components of the teaching process (goals, content, methods, means, etc.), which are realized by specific means. E-learning is of three types: Attended when the teaching process takes place within the contact hours of the teacher and students, and the transfer of educational material is carried out through an electronic course; Distance learning involves conducting the learning process without the physical presence of the professor. The training course is conducted from start to finish remotely, in electronic format; Hybrid (face-to-

face/distance) - the main part of teaching takes place remotely, and a small part is carried out within the framework of contact hours.

Consultations should help the student, with the help of the teacher, to master the habits of independent work, to correctly conduct work on educational literature and other sources, and to clarify the issues raised during independent work.

CBCR (Case-Based Clinical Reasoning) is an educational approach commonly used in medical and health sciences education to help students develop clinical reasoning skills. In this method, learners are presented with real or simulated clinical cases that they must analyze and solve using their knowledge, problem-solving skills, and reasoning abilities.

Key Features of Case-Based Clinical Reasoning (CBCR):

- ✓ Case-based learning: The method focuses on real-world clinical cases, which often mimic the complexity and unpredictability of actual patient scenarios. These cases encourage students to think like healthcare professionals by diagnosing and treating patients based on the information provided.
- ✓ Interactive and collaborative: CBCR is often conducted in groups, where students discuss the cases, share insights, and collaborate to reach a diagnosis or treatment plan. This interactive setting helps promote peer learning and enhances critical thinking.
- ✓ Focus on reasoning: Rather than just memorizing facts, students are encouraged to apply their knowledge to reason through cases, considering differentials, clinical symptoms, diagnostic tests, and possible interventions.
- ✓ Integration of theoretical knowledge and practice: CBCR helps bridge the gap between theoretical learning and practical application by integrating basic sciences with clinical practice.
- ✓ Iterative process: As students work through the case, they often receive feedback, are presented with new information, or are asked to reflect on their reasoning, making it an iterative process that enhances learning.
- ✓ Role of the facilitator: Instructors or facilitators guide the discussion but do not provide direct answers. Their role is to challenge students' thinking, ask probing questions, and help learners explore the case from different perspectives.

Benefits of Case-Based Clinical Reasoning (CBCR): Enhances clinical decision-making skills; Promotes active learning and critical thinking; Encourages teamwork and communication; Prepares students for real-life clinical problem-solving. This method is widely used in medical schools, nursing education, and other health professions to train students in thinking like clinicians.

CBD (Case-Based Discussion) is a structured, formative assessment tool used in medical education to evaluate and improve a learner's clinical reasoning, decision-making, and application of knowledge to real patient cases. It is typically part of workplace-based assessment (WBA) frameworks, focusing on reflective learning through in-depth discussion of clinical cases the learner has been involved with.

Key Features of (Case-Based Discussion) CBD:

- ✓ Focus on real cases: The discussion revolves around a clinical case that the learner has directly managed or been involved in. It is typically drawn from actual clinical practice rather than hypothetical scenarios.
- ✓ Reflective discussion: The method involves a structured dialogue between the learner and an experienced clinician (usually a mentor, supervisor, or assessor) about the clinical reasoning and

decisions made during the management of the case. The focus is on reflection, exploring why certain decisions were made, and considering alternatives.

- ✓ Evaluation of clinical reasoning: CBD is designed to assess how well the learner can apply clinical knowledge to real-life situations, taking into account patient history, diagnosis, treatment, and follow-up. It emphasizes clinical reasoning and the thought process behind medical decisions rather than just the outcomes.
- ✓ Interactive and formative: CBD is an interactive method where the learner and the assessor explore the case together. The goal is formative, meaning it is aimed at providing feedback to the learner to enhance their skills rather than simply giving a grade or judgment.
- ✓ Customizable to learning needs: The discussion can be tailored to the learner's level of expertise and the specific competencies being assessed. Different aspects of the case, such as diagnosis, management, communication skills, ethical considerations, or teamwork, can be explored based on the individual's learning objectives.
- ✓ Documentation and feedback: The assessor provides feedback, which is typically documented to track the learner's progress over time. The feedback is usually focused on areas for improvement, strengths, and any learning opportunities identified during the discussion.

Steps in a (Case-Based Discussion) CBD:

- ✓ Case selection: The learner selects a clinical case they have managed that offers scope for discussion on clinical reasoning and decision-making.
- ✓ Preparation: The learner reviews the case details, including patient history, diagnosis, treatment, and outcome. The assessor may also review relevant case notes or patient data.
- ✓ Discussion: A structured discussion takes place between the learner and assessor, covering the learner's reasoning, decision-making, and understanding of the case. The assessor may ask open-ended questions to probe the learner's knowledge and approach.
- ✓ Feedback: The assessor provides detailed, constructive feedback, focusing on what the learner did well and areas where they can improve.
- ✓ Reflection: Learners are encouraged to reflect on the feedback and the case to identify learning points and future improvements.

Benefits of (Case-Based Discussion) CBD: Helps learners develop deeper clinical reasoning and critical thinking; Provides an opportunity for personalized feedback based on real clinical experience; Encourages reflection on clinical practice, promoting lifelong learning; Assists in identifying learning needs and areas for improvement. Commonly Used In: Medical education and postgraduate training (e.g., residency programs). Other healthcare professions like nursing, dentistry, and allied health. (Case-Based Discussion) CBD is particularly valuable for developing clinicians as it integrates clinical experience with academic learning, offering a well-rounded approach to building competency in real-world medical practice.

Conclusion

- The manifestation of modern teaching and learning methods in higher education institutions, particularly in medical educational study programs, reflects a global trend toward enhancing the quality of medical education. By embracing student-centered approaches, integrating technology, and emphasizing competency-based education, medical faculties (medical schools) can better prepare future healthcare professionals for the complexities of modern healthcare delivery. However, overcoming challenges related to resistance to change, resource constraints,

and assessment validity is crucial for the successful implementation of these innovative teaching methodologies.

- The global landscape of medical education is undergoing transformative changes through the adoption of modern teaching and learning methodologies. These innovations, ranging from technology-enhanced learning tools to competency-based education and interdisciplinary approaches, are reshaping how future medical professionals are trained. The integration of evidence-based teaching strategies ensures that students not only acquire theoretical knowledge but also develop critical thinking, problem-solving, and clinical skills essential for addressing complex healthcare challenges.

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